U.S. ATLAS Status Report

June 6, 2017

News

Annual US ATLAS Workshop will be held at ANL, July 25-28

Have begun annual institute chats
- 12 completed so far
- expect to finish in late July
- will be prepared to discuss the author list in mid-August

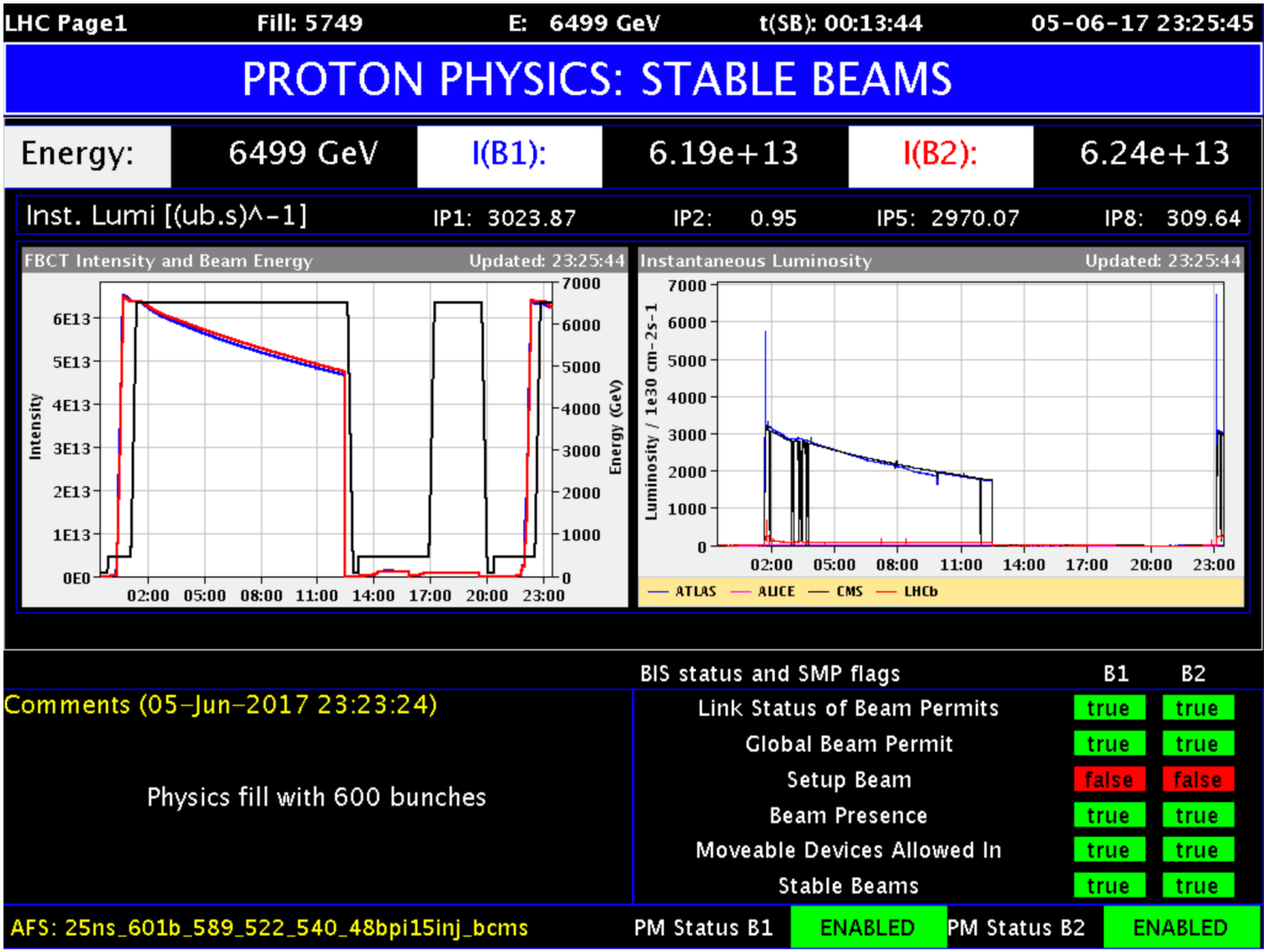
Annual Budget scrubbings are set
- M&O (including I&C and R&D) @ ANL, July 24, 28
  (in conjunction with the US ATLAS workshop)
- S&C and PS @ Boston University, August 9-11

Operations Report

Eric Torrence (Oregon)

June 6, 2017

2017 Run Underway



Recent Schedule

Updated plan…

ATLAS mini VdM scan
(assuming solenoid back tomorrow)

	M	T	W	T	F	S	S
Week 21	22/5 commissioning	SB 3b*	commissioning (72bpi)	commissioning (VdM)	commissioning (spare 72/ VDM?)	commissioning (VdM MP)	commissioning
		commissioning	12b SB*	12b SB*	72b SB (12bpi)	72b SB (12bpi)	300b SB (12bpi)
Week 22	29/5 24hr of scrubbing (72bpi)	commissioning	Injector TS (~30hr without to inject)	ACCESS	commissioning	commissioning	commissioning
		300b 48 or 12bpi	300b SB		3/600b SB (48bpi)	600b SB (48bpi)	600b (96bpi)
Week 23	5/6 600b (96bpi)	6 days of scrubbing with mostly 288bpi					

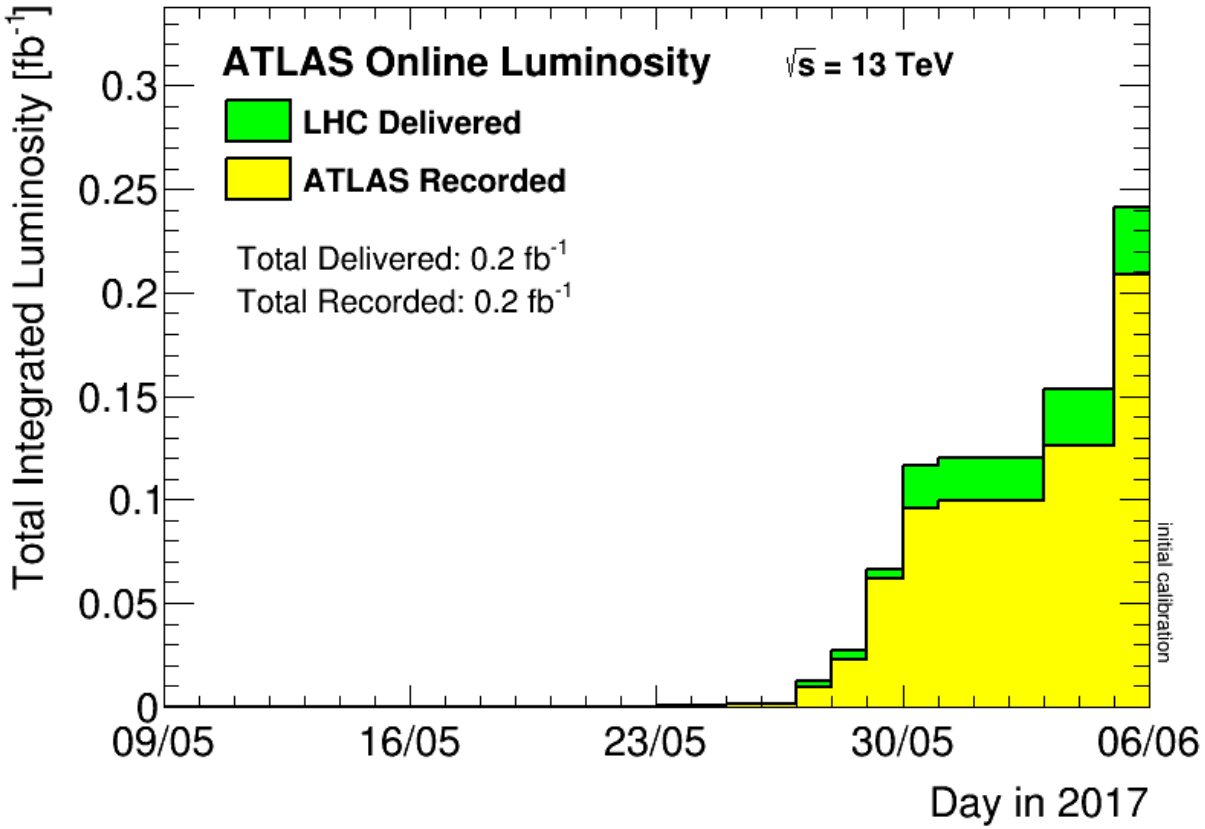
LHCb magnet off (kept off for scrubbing)

Discuss on next slide

Thanks to good availability, and fast turnaround of machine protection checklist, we are ahead of last weeks plan!

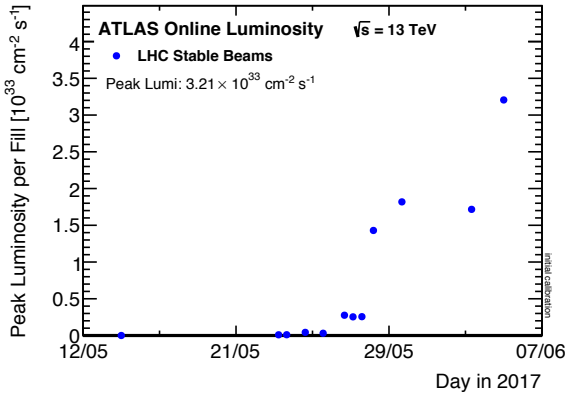
- Lots of commissioning activities during low-bunch runs
- Starting this week with scrubbing (needed for higher currents)

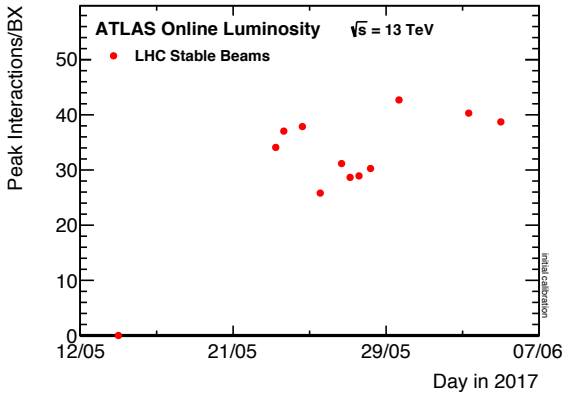
LHC Performance

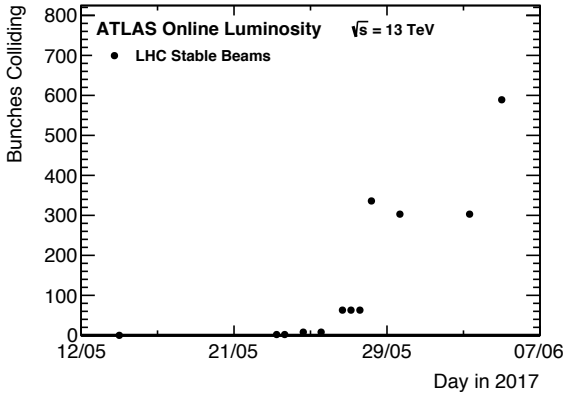


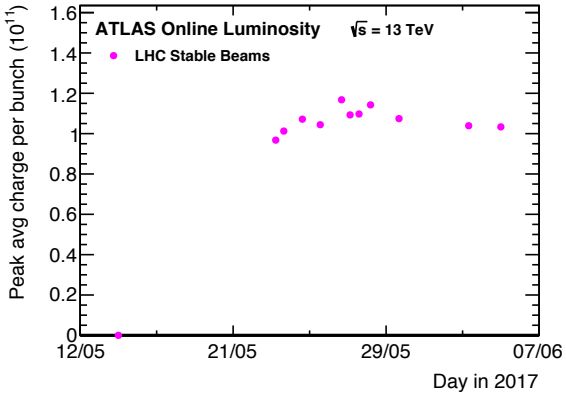
- Stable beams for about 2 weeks
- Luminosity changing quickly as number of bunches ramps up

LHC Performance



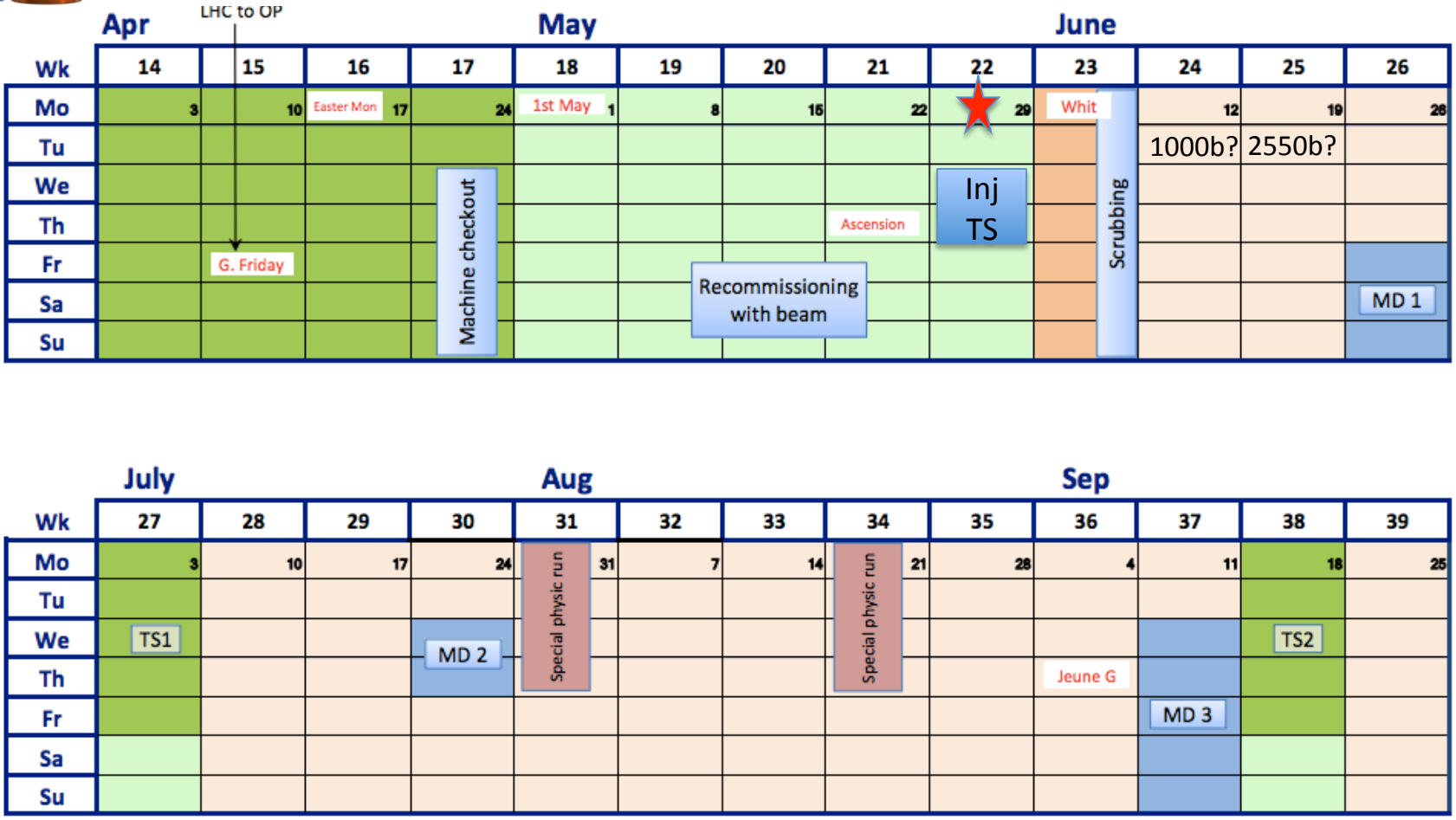






- Peak interactions/crossing ~ 40, L_{peak} = 3.5 x 10^{33} cm^{-2} s^{-1}
- Up to 600 bunches, next steps 900, 1200, 1800, 2400, 2550

Current Schedule



- Plan is to have a full machine with 2550 bunches in ~2 weeks

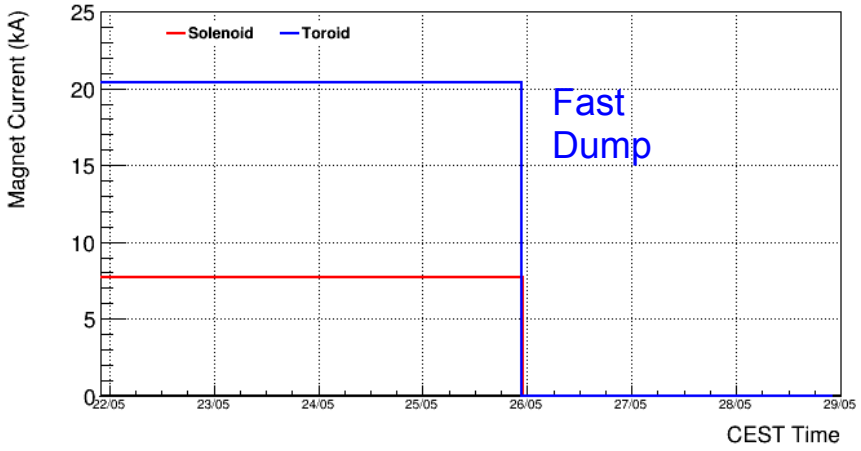
LHC Issues

- Blown thyratrons in PS Booster has taken out 1 of 4 rings
  - 3 blown, 2 spares on site, replacements being procured
  - Can not implement BCMS injection scheme without all 4 rings working
  - Scrubbing beams are OK, so will proceed with that program
  - Expected to be fixed this week

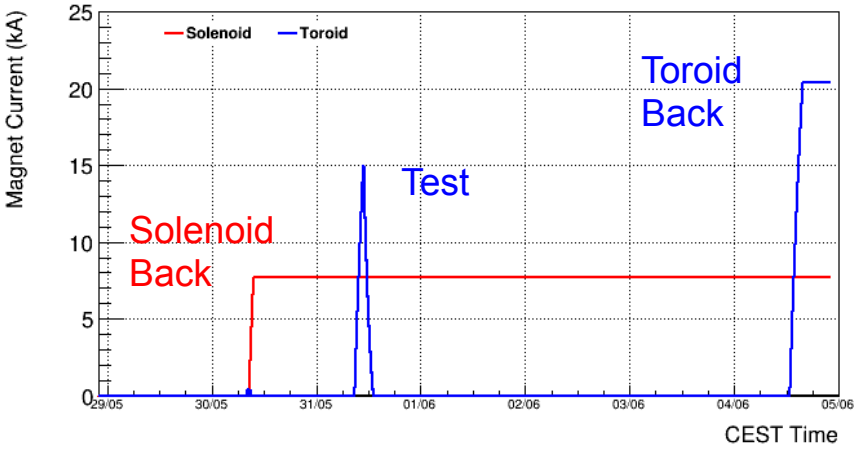
Now fixed

ATLAS Issues

- Unplanned Toroid dump on Friday 5/26
  - Also brought down solenoid (shouldn't happen)
  - Not a US responsibility, but certainly a concern
  - Solenoid back on quickly
  - Left toroid off to take (planned) muon alignment data



May 22 - 28



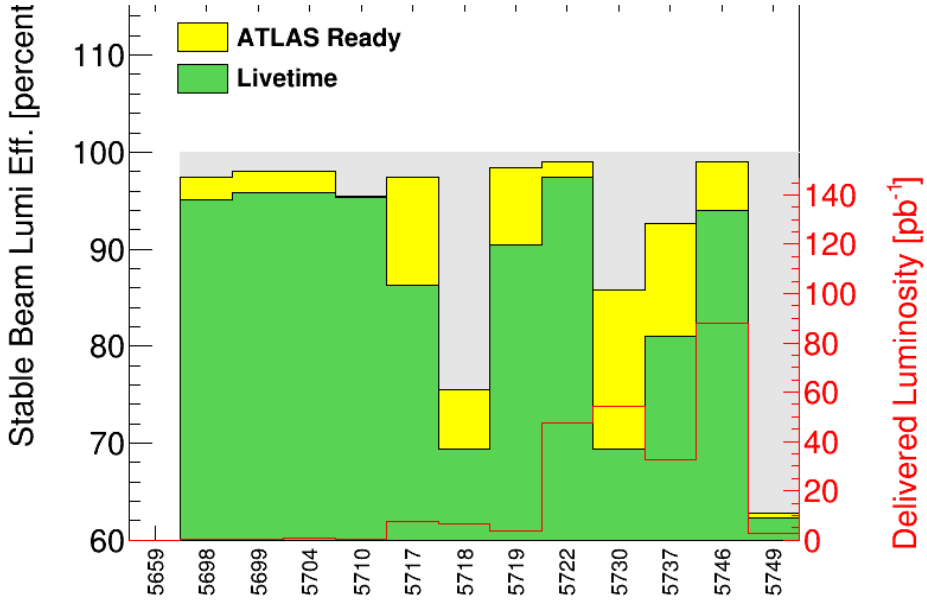
May 29 – June 5

ATLAS Activities

- Muon alignment data completed
  - Special trigger menu with high rate, no toroid muon calibration data
  - Needed every year to establish absolute calibration and alignment
- Preliminary mini-vdM scan
  - Used to get first estimate of luminosity scale
  - Significant replacement of LUCID PMTs
  - More complete scan will be scheduled when CMS pixels are fully commissioned
- Many detectors have upgraded readout to handle $\mu \sim 60$
  - Some minor commissioning issues, but all are performing well
  - New hardware timed in quickly to bunch crossing
  - Extended LAr data collected with 32 samples when solenoid off
- Minor issue with inrush current limiting thermistors
  - Thermistors failing at alarming rate taking down one rack at a time in HLT farm
  - Replacement campaign ongoing, no further failures in replaced power supplies
- No major issues or points of concern so far

ATLAS Recording Efficiency

Peak Stable Lumi	3.21×10^{33} cm^{-2} s^{-1}	
Peak <Events>/BX	42.7	
Avg <Events>/BX	28.3	
	Lumi (pb^{-1})	Percent
Physics Beams Del.	241.6	100.0%
ATLAS Ready Del.	228.5	94.6%
ATLAS Ready Rec.	209.0	86.5%
Del. after Warmstop	0.6	0.3%



- Efficiency so far hampered by many special runs
  - High deadtime in LAr 32 sample mode
  - Mini-vdM scan
  - High rate muon calibration data
- Already improved with most recent fill (95% recorded)

Software, Computing & Physics Support

P. Calafiura (LBNL), K. De (UTA)
A. Arce (Duke), K Black (BU)

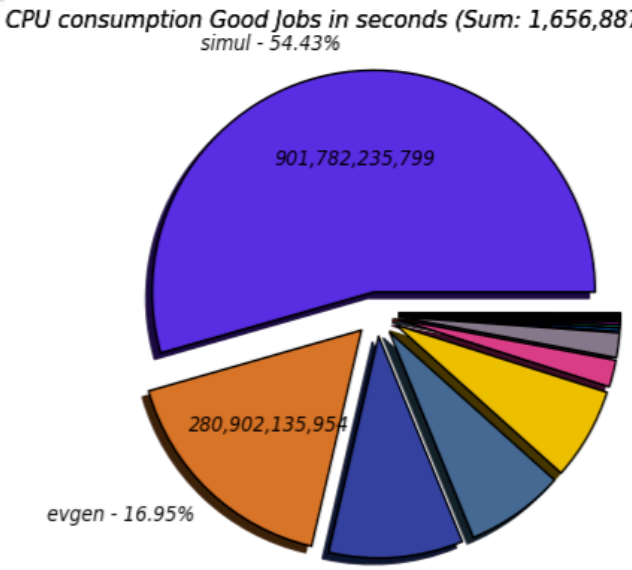
June 6, 2017

Computing and Software

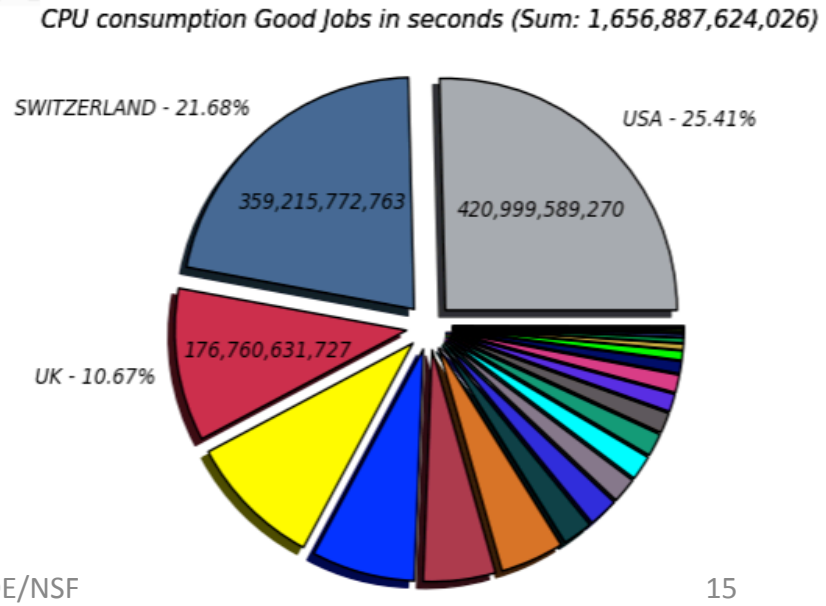
- US Facility contribution to MC16 production campaigns
- Progress with HPC exploitation
- First stable beams in 2017
- HEP Community White Paper and NSF HL-LHC S2I2 conceptualization
  - US ATLAS researchers actively involved in all working groups
  - US ATLAS and CMS Computing management meeting regularly to discuss long-term plans and opportunities to collaborate in areas such as distributed computing, and opportunistic resources (including commercial clouds and HPC)

US ATLAS Facility

Production statistics from ATLAS Dashboard March-May



MC16 production campaign in full swing:
80% of ATLAS cycles used for event generation, full G4 simulation, and pileup/digitization



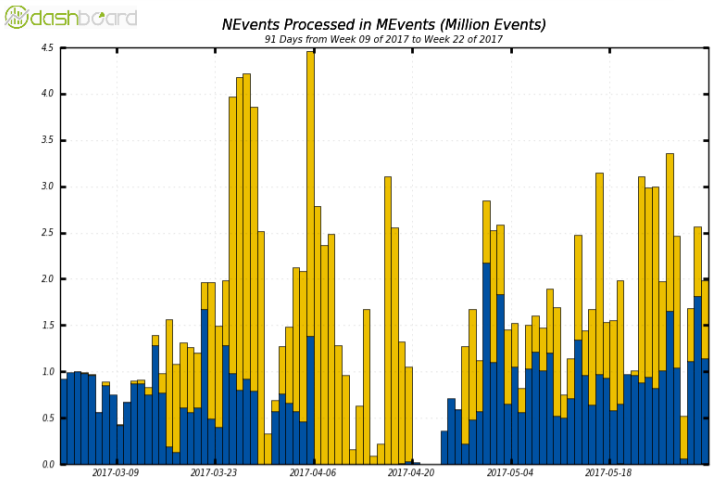
US Facility delivering ¼ of the cycles, slightly over 23% “fair share”.

Approx 10% of US cycles coming from HPC

HPC Exploitation

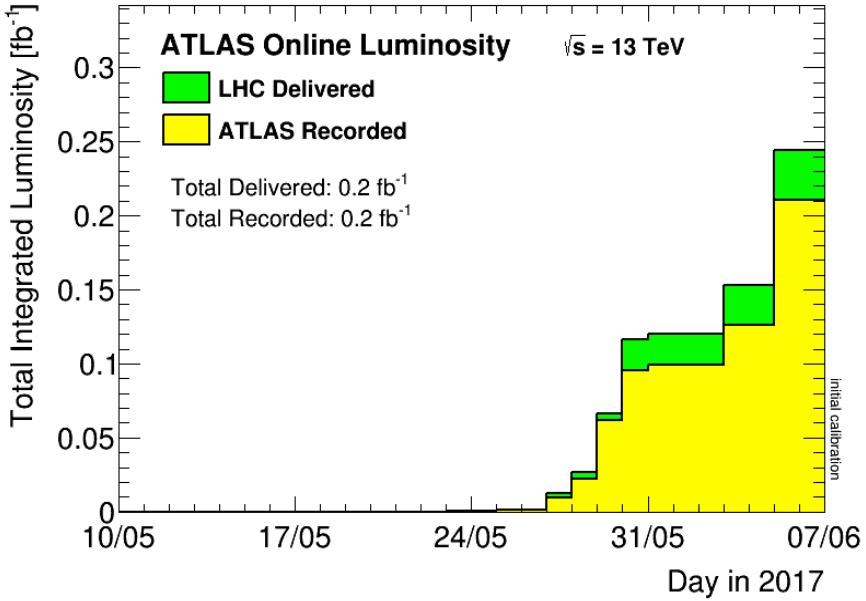
NERSC edison/cori1 and ORNL titan in production. ~2M full G4 events/day since March

notice that titan processed ~20% more events than reported by dashboard (cannot be fixed till new dashboard)

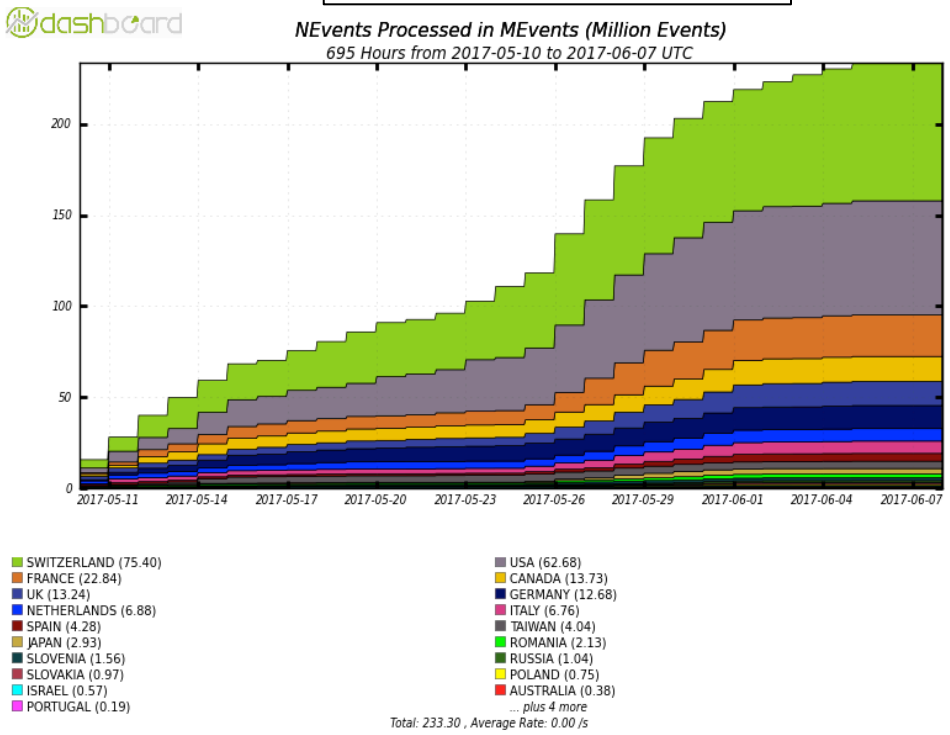


- NERSC cori2 and ALCF theta running G4 validation samples.
- Multiple development efforts targeting US HPCs
  - ATLAS Event Service, PanDA "jumbo-jobs", docker/shifter containers,....
- Used 19M of 25M hours HEP/ALCC allocations at NERSC
  - running opportunistically at OLCF and on ALCF theta
- Just got 200M hours ALCC award (5x more than 2016/17)
- Working on our best estimate of computing needs 2017-2030, and role of HPC in US ATLAS facility, as requested by OHEP

First stable beams in 2017



Reconstruction-only



US Facility playing major role in early reconstruction processing

Physics Support - ATC, Shared Tier3

- ATC (US ATLAS Center) proposal submitted to DOE in February
- Call for proposals was to US ATLAS in March − have received 15 applications for funds for the ATC at ANL, BNL, LBNL, SLAC
  - physics analysis
  - performance studies
  - hardware upgrades
  - workshops
- Review committee sent in reviews, panel discussion reviewed on
  - scientific merit
  - ability to impact ATLAS/ US ATLAS
  - ability to support and increase diversity
- Expect final funding decisions this week
- Call for shared Tier 3 out to US ATLAS several weeks ago - 5 expressions of interest to host shared Tier3 so far